

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
SUPPLEMENTARY SHEET

Re item V.

- 1 The present report makes reference to the following document:
D1: US-B1-6 546 342 (DOUGHERTY JOHN JAMES *ET AL*) 8 April 2003
- 2 INDEPENDENT CLAIMS
- 2.1 Document D1 is regarded as the closest prior art. It discloses (the references in parentheses relate to said document):
 - a method for the detection of ground faults (abstract) on electronic releases (102) for low-voltage power breakers (56-62) having upstream measuring amplifiers (34-40),
the output signals from the measuring amplifiers (34-40) being summated in a summing amplifier (42),
and the output of the summing amplifier (42) representing a signal for ground-fault monitoring,

from which the subject matter of independent claim 1 differs by the fact that:

the output signals from the measuring amplifiers are pulse-modulated in terms of phase, and the duration of the pulses is controlled by the release as a function of the gain factor of the respectively associated measuring amplifier.

The subject matter of claim 1 is therefore novel (PCT Article 33 (2)).

- 2.3 With reference to claim 2, document D1 discloses:
 - a circuit arrangement for the detection of ground faults on electronic releases (102) for low-voltage power breakers (56-62) having upstream measuring amplifiers (34-40),
the outputs of the measuring amplifiers (34-40) together being connected to the input of a summing amplifier (42), whose output represents a signal for ground-fault monitoring,

from which the subject matter of independent claim 1 differs by the fact that:

switches, which can be driven in a pulse-width-modulated manner by the release on the basis of the gain factors of the measuring amplifiers and to

which in each case one output of a measuring amplifier is connected, and the outputs of the switches together are connected to the input of a summing amplifier.

The subject matter of claim 2 is likewise novel (PCT Article 33 (2)).

2.3 The problem addressed by the present invention can thus be considered that of specifying a method and a circuit arrangement for the detection of ground faults in accordance with the prior art which makes it possible to compensate for the measurement chain of respective phases in a cost-effective manner and without hardware-oriented steps.

The solution to this problem proposed in claims 1 and 2 of the present application - namely adjusting the pulse duration on the basis of the gain factors - involves an inventive step (PCT Article 33 (3)):

no indications of this solution are given in the prior art.

3. DEPENDENT CLAIMS

Claims 3 and 4 are dependent on claim 2 and thus likewise meet the PCT requirements for novelty and inventive step.

4. INDUSTRIAL APPLICABILITY

The method and the apparatus in accordance with the present application are used in electrical systems. The requirements of PCT Article 33(4) for industrial applicability are therefore also met.